The Healing Forest: Medicinal and Toxic Plants of Northwest Amazonia, by RICHARD EVANS SCHULTES & ROBERT F. RAFFAUF, with a Foreword by HRH Prince Philip, Duke of Edinburgh. (Historical, Ethno- and Economic Botany Series, Vol. 2.) Dioscorides Press (an imprint of Timber Press Inc.), 9999 SW Wilshire, Portland, Oregon 97225, USA: 500 pp., 136 b/w photos etc., 18.75 x 26.25 x 4 cm, hardbound, US $59.95 *plus* US $3 for shipping and handling for first book, US $2 for each additional copy, 1990.

This is a major work on an important subject. The tropical rain-forest contains the greater part of the world's species of flora and fauna, and its conservation is an essential component of the global strategy for the protection and maintenance of genetic resources. Nevertheless, it is being destroyed or degraded at an alarming and still accelerating rate. Current (1990) estimates put the annual loss of tropical forest, permanently or temporarily, at approximately 20 million hectares, which compares with the estimate of 11 million hectares as recently as 1980. This destruction is common to all areas of the tropics; however, it has been the developments in the Amazon Basin which have particularly attracted the concern of the world's media and the general public, because of the vast scale on which the forests there are being lost, and of the impact on the indigenous Amerindian populations that are dependent on them.

Causes of Deforestation

The causes of the destruction are well known. In the first place, there is the clearance of forest for other uses — mainly agricultural. Secondly, the cutting of trees for fuel-wood, particularly in the drier and less-well-wooded parts of the tropics, is leading to forest degradation, and eventual desertification. Thirdly, there is the role of commercial exploitation: even if its direct impact is relatively minor, it is contributing to the problem through the opening up of the forest to land-hungry subsistence farmers and other colonizers.

The underlying problem is that the tropical forest has traditionally been treated as a common good — a public 'commons' — hence to be exploited in any way that Man, whether indigenous or arriving from elsewhere, has wished to use it. The same thing has happened — and is still happening — in parts of the developed world in the name of economic development, sometimes with equally distressing results. There has usually been nothing to demonstrate forcefully to the exploiters and legislators that the forest is more valuable to society when maintained as a forest ecocomplex than by being converted to other uses. The indigenous forest dwellers have known this instinctively for centuries, but have been powerless to protect their environment in the face of external interests.

Importance of Conservation

This is where the work of Schultes & Raffauf comes in — or ought to. We are urgently in need of arguments for the conservation of the tropical forest as a sustainable and renewable source of benefits to Mankind with which to confront the law-makers and administrators, in whose hands its fate ultimately lies. Reading the foreword by the Duke of Edinburgh, one's expectations are raised that this will be the book to do so. In the 480 pages that follow, there is indeed a massive amount of information about the non-destructive uses of the forest as practised by the Amerindians of Northwest Amazonia. The book will thus stand as a worthy testimony to lifetimes of dedicated and thorough research and investigation by the two Authors and their many collaborators in the fields of ethnobotany and phytochemistry. Some 1,500 species and variants from 600 genera and 145 plant families are described, including their chemical and pharmacological properties. It is copiously illustrated with black and white photographs, prints and drawings, which add greatly to the interest of the descriptive material.

Systematic descriptions take up some ninety per cent of the book and provide an invaluable reference source. The remainder consists of the preface and appendices, one of the most useful of the latter being an index of symptoms, diseases, and treatments, of ailments. The descriptions themselves include the type and distribution of the plants, any chemical data available (in the majority of cases analysis has apparently not yet been undertaken), the parts of the plant that are used by the local people and in what form, how these products are prepared and how they are used. One can only marvel at the ingenuity of those who, through trial and error over centuries, have discovered how to benefit from the natural resources around them, and humbly recognize how much there is to learn from them.

Practically All Plant-parts Used

Virtually every part of these plants may be used — leaves, flowers, fruits, bark, roots, sap, or wood. For human applications, the products may be ingested as teas, gargled, used as poultices, rubbed on the body as decoctions, infusions, or as raw leaves or bark, taken as snuff, smoked, or applied as enemas. The uses to which these plant products may be put seem almost as numerous as human afflictions, ranging as they do from healing of wounds to easing of internal disorders, from insect- and snake-bites to baldness, and from tooth care to sexual or reproductory malfunctions. In addition, various other uses are described, including arrow-head and fish poisons, narcotics, and pottery. In many cases, the role of the tribe's medicine man in the preparation and application of medicines is integral, the process often involving dances or other long-established rituals. The important contribution of the Amerindians of the Northwest Amazon and their medicine men to the book, through their readiness to share their knowledge of the properties and uses of the local flora, is acknowledged by the Authors.

Notwithstanding all these positive features, a slight sense of disappointment with the book comes from wondering who will derive benefit from it: not the indigenous peoples of the Amazon forests themselves, nor those in whose hands the fate of the forests directly lies (given that it is written in English). There will be many research workers who will turn to it for specific information, and who will not be daunted by the price (US $59.95), which is by no means unreasonable for a volume of this calibre. In its present rather indigestible form, however, it is unlikely to have the impact on the opinion-formers and decision-makers that it could and should have. Despite (or perhaps even because of) the wealth of information which it contains, the book does not bring out sharply enough just how and why the tropical forest is so important for those of us who live far removed from it, as well as for the people who live in and from it.

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Storehouse of Medicinal Plants and Genes

Yet it still could make a significant impact. The Authors should be encouraged to carry on where they have left off by explaining to influential audiences the potential role that medicinal plants could play in the conservation of the tropical forest ecocomplex, including the indigenous peoples. The material is largely to hand from this book and would form the basis for a stimulating article in a renowned journal such as *Environmental Conservation*.* These days we are exposed to an excess of emotional appeals. Here in this book there is the basis for an incontrovertible, scientifically-based argument for conservation; it deserves to be effectively deployed, at least by means of translations and pamphlets.

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*We already have such coverage in the paper by Professors Nigel J.H. Smith & Richard Evans Schultes entitled 'Deforestation and Shrinking Crop Gene-pools in Amazonia', published on pages 227–34 of our present issue, and appropriately following the same Authors' Guest Editorial entitled 'Amazonia's Rich Storehouse of Genes Vital for Improving Food and Cash Crops', published in our preceding issue (*Environmental Conservation*, **17**(2), pp. 103–4 with 4 figs and table, Summer 1990). — Ed.

Techniques for Desert Reclamation, Edited by ANDREW S. GOUDIE. (Environmental Monographs & Symposia.) John Wiley & Sons, Chichester–New York–Brisbane–Toronto–Singapore: xiii + 271 pp., numerous figs & tables, 23.5 x 15.7 x 1.8 cm, price £39.95 or US $80.40, hardback, 1990.

Arid lands, including deserts, have become one of the major concerns of the world. For (1) they represent more than one-third of the global land-area, and hence provide room for expanding our food-producing territories; and (2) extensive areas of productive lands in the semi-arid and sub-humid regions adjoining the arid lands are subject to Man-induced ecological degradation and are being transformed to desert-like landscapes, thus adding to the area of arid lands through desertification. This two-pronged situation calls for actions to reclaim arid lands (deserts) and to combat desertification, all of which activities need — among other things — techniques that ensure sustainable development of land and water resources in deserts.

For these considerations, this is an especially welcome book. The cord that ties together the components of this book is that land-use pressures in excess of the capacity of the land-and-water resource systems (overcultivation, overgrazing, excessive deforestation, etc.) cause ecological degradation; and corrective action should likewise be through sound management and use of appropriate techniques.

Chapter 1, by the Editor of the volume A.S. Goudie, Professor and Head of Geography in the University of Oxford, provides a state-of-the-knowledge report on the inherent and the Man-induced degradation of arid lands (desertification). As the Author sets the stage for the rest of the book, he reviews briefly the evolution of our understanding of the concept of desiccation as a natural phenomenon (aridity) and as a Man-induced process, while dealing in some detail with the human causes of desert degradation. He then addresses the question of human-induced climate change and provides a critical review of various perceptions of climatic deterioration. The final part reviews evidence of reduction of rainfall during recent decades, and shows that it may be notable in certain regions (*e.g.* Sudano–Sahel of Africa) but not world-wide.

Chapters 2 (A. Watson) and 3 (N.J. Middleton) deal with aeolian processes of sand movement and soil erosion. The former chapter surveys and evaluates different techniques for controlling drifting sand and for dealing with mobile sand-dunes. The Author, referring to extensive experiences in Saudi Arabia, deals with the subject in a systematic manner, identifying the problem and means used in dealing with it. This provides the reader with an enumeration of the forms of sand-bodies as recognized in the field, and also a compendium of means of remedy together with examples of field operation.

Chapter 3 examines the factors involved in processes of wind erosion — the attributes of wind and the erodibility of surface deposits (soil). It then surveys major areas of the world that are prone to wind erosion, and enumerates methods for control of wind erosion and for soil conservation. These two chapters, 2 and 3, though different in approach, provide analyses of this world-wide problem, and also an inventory of techniques to be used and systems of management to be adopted.

Chapters 4 (J.D. Rhoades) and 5 (W.M. Adams & F.M.R. Hughes) deal with two closely-interrelated issues, namely irrigation and secondary salinity of soil and water in arid lands, while providing a brief but ample review of our knowledge of a subject that is otherwise covered in extensive and voluminous literature. The former chapter deals with problems of soil salination, waterlogging, water pollution, etc., as related to irrigated farmlands world-wide (954 million ha of salt-affected soils); effects of salinity on plants and on soils; and the role of drainage in the reclamation of salt-affected lands. The Author addresses the geohydrologic processes in irrigation systems that relate to development of salinity. In the final section he describes means for controlling salinity in various components of the system: rhizosphere and soil, irrigation network and drainage network.

Of chapter 5 the first half deals with irrigation as the means of transforming arid land into permanent farmland, and the various sources of water (surface and ground); describes and evaluates various means of conveying water from source to field, and various methods of irrigation; and discusses environmental aspects of water storage (reservoirs), irrigation, and farming, in arid lands. The second half provides analysis of a case-study: the Bura Irrigation Project in Kenya. The Authors cover, in an admirably succinct manner, the history of feasibility studies and negotiations with funding sources, expectations, problems, etc. Problems are only partly technical, being mainly socio-economic and managerial.

Chapter 6 (R. Lal) addresses issues related to water erosion and methods that may be used for soil conservation. In the first half of this chapter the Author explains the processes involved in the detachment and transport of soil particles, and the features of arid lands (climate, landform, and soil characters) that make them particular-